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10/073,991	02/14/2002	Ross D. Armstrong	PAT 51049-2	6631

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EXAMINER

EDMONDSON, LYNNE RENEE

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 07/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/073,991

Applicant(s)

ARMSTRONG ET AL.

Examiner

Lynne Edmondson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-21, 23-32 and 34-41 is/are rejected.
- 7) ☒ Claim(s) 8, 22 and 33 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-7, 40 and 41 are rejected under 35 U.S.C. 102(e) as being anticipated by Amita et al. (US 2002/0046627 A1).

Amita teaches a method of joining an aluminum fin folded assembly to a copper plate to form a heat sink (paragraph 61) comprising the steps of screen printing a Sn-Zn solder paste to the copper plate (paragraphs 53-55). The paste contains flux (paragraphs 75 and 116-118) and is heated to a temperature from 210 to 230 when using a paste comprising 91%Sn and 9%Zn (paragraph 119). The copper is presumed to be unplated. See also Amita claims 1-4.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 9-14, 17, 29-32 and 34-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amita et al. (US 2002/0046627 A1) in view of Saperstein (RE 35098).

Amita teaches a method of joining an aluminum fin folded assembly to a copper plate to form a heat sink (paragraph 61) comprising the steps of screen printing a Sn-Zn solder paste to the copper plate (paragraphs 53-55). The paste contains flux (paragraphs 75 and 116-118) and is heated to a temperature from 210 to 230 when using a paste comprising 91%Sn and 9%Zn (paragraph 119). The copper is presumed to be unplated. A hot plate (hot blast stove) or reflow oven is employed (paragraph 151). However, there is no disclosure of an assembly fixture. Neither are plural fin assemblies taught.

Saperstein teaches bonding of a heat exchanger assembly wherein a folded fin is bonded to a plate (figure 9) via solder and flux (col 2 lines 55-67 and col 3 lines 4-30) using a fixture for holding the assembly in tight contact prior to bonding (support plates 21, col 2 lines 38-55 and figures 3 and 7). The parts bonded are aluminum and copper (col 3 lines 45-58). See also Saperstein claims 1 and 6.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a temporary assembly fixture or other holding means to allow assembly transport into and out of ovens (Amita, paragraphs 151-152) on a belt (Amita, paragraph 160) without misalignment prior to reflow. Attachment of plural fin assemblies would be performed in the same method. Plural fins are an obvious variation of a single fin.

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5. Claims 15, 16 and 18-21 rejected under 35 U.S.C. 103(a) as being unpatentable over Amita et al. (US 2002/0046627 A1) in view of Tadauchi et al. (USPN 6186390 B1).

Amita teaches a method of joining an aluminum fin folded assembly to a copper plate to form a heat sink (paragraph 61) comprising the steps of screen printing a Sn-Zn solder paste to the copper plate (paragraphs 53-55). The paste contains flux (paragraphs 75 and 116-118) and is heated to a temperature from 210 to 230 when using a paste comprising 91%Sn and 9%Zn (paragraph 119). The copper is presumed to be unplated. A hot plate (hot blast stove) or reflow oven is employed (paragraph 151). However, there is no disclosure of solder in the form of a sheet.

Tadauchi teaches bonding of aluminum and copper via a Sn-Zn solder sheet comprising 3-12% Zn in a balance of Sn (col 2 lines 47-58). The solder sheet is a variation of a solder paste comprising a flux having the same composition used in the same manner (col 5 lines 45-53). Flux may also be applied to the solid preform (col 11 lines 11-28).

It would have been obvious to one of ordinary skill in the art at the time of the invention that a solder sheet is an obvious variation of solder paste and is conventional in the art. The sheet and paste comprise the same composition and are both used to bond aluminum to copper in a reliable manner.

6. Claims 23-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amita et al. (US 2002/0046627 A1) in view of Tadauchi et al. (USPN 6186390 B1) as applied to claim 15 above, and further in view of Saperstein (RE 35098).

Amita teaches a method of joining an aluminum fin folded assembly to a copper plate to form a heat sink (paragraph 61) comprising the steps of screen printing a Sn-Zn solder paste to the copper plate (paragraphs 53-55). The paste contains flux (paragraphs 75 and 116-118) and is heated to a temperature from 210 to 230 when using a paste comprising 91%Sn and 9%Zn (paragraph 119). The copper is presumed to be unplated. A hot plate (hot blast stove) or reflow oven is employed (paragraph 151). However, there is no disclosure of solder in the form of a sheet.

Tadauchi teaches bonding of aluminum and copper via a Sn-Zn solder sheet comprising 3-12% Zn in a balance of Sn (col 2 lines 47-58). The solder sheet is a variation of a solder paste comprising a flux having the same composition used in the same manner (col 5 lines 45-53). Flux may also be applied to the solid preform (col 11 lines 11-28).

However, neither reference teaches an assembly fixture.

Saperstein teaches bonding of a heat exchanger assembly wherein a folded fin is bonded to a plate (figure 9) via solder and flux (col 2 lines 55-67 and col 3 lines 4-30) using a fixture for holding the assembly in tight contact prior to bonding (support plates 21, col 2 lines 38-55 and figures 3 and 7). The parts bonded are aluminum and copper (col 3 lines 45-58). See also Saperstein claims 1 and 6.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a temporary assembly fixture or other holding means to allow assembly transport into and out of ovens (Amita, paragraphs 151-152) on a belt (Amita, paragraph

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160) without misalignment prior to reflow. Attachment of plural fin assemblies would be performed in the same method. Plural fins are an obvious variation of a single fin.

### ***Allowable Subject Matter***

7. Claims 8, 22 and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: The closest prior art teaches Cu and Ni as part of the fin material or as an aluminum plating material. There is no disclosure of a Ni-plated copper base plated soldered to a folded aluminum fin. See Fujikura et al. (JPN 2002-151635-A) and Matsuda et al. (USPN 5077889).

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Mori et al. (USPN 6221197 B1, Sn-Zn solder sheet), Pravda et al. (USPN 3766977, assembly fixture) and Ishikawa et al. (USPN 4749627, assembly fixture).

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne Edmondson whose telephone number is (703) 306-5699. The examiner can normally be reached on Monday through Thursday from 6:30 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7718 for regular communications and (703) 305-7115 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

LRE  
June 26, 2003

Lynne Edmondson  
Examiner  
Art Unit 1725



6/26/03